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Results Obtained from New and Remodeled Poultry Houses in South Dakota

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RESULTS OBTAINED FROM NEW AND REMODELED POULTRY HOUSES IN SOUTH DAKOTA

BY

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RESULTS OBTAINED FROM NEW AND

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IN SOUTH DAKOTA

This thesis is approved as a creditable, independent investigation by a candidate for the degree, Master of Science, and acceptable as meeting the thesis requirements for this degree; but without implying that the conclusions reached by the candidate are necessarily the conclusions of the major department.

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PREFACE

An interest in poultry housing in the state of South Dakota was stimulated during 1947 and 1948 when the author was part owner of a hatchery in Brookings. At that time modern poultry housing was no more than shelter from the wind and rain. It provided few labor savers and afforded little protection from extreme hot and cold temperatures.

Breeding birds that froze their combs in winter would stop producing fertile eggs. Many egg production flocks would go into a winter pause in production soon after the start of a long period of extremely cold weather. Water would freeze unless heated fountains were provided. Litter would cake over and get wet so the house had to be cleaned every few days. Wet litter caused the birds to be uncomfortable and disease outbreaks were difficult to handle. During certain seasons of the year most of the eggs were dirty before they were gathered.

Many of the flockowners learned to hate the poultry flock when this situation existed because it demanded a lot of tedious work and the returns were not great. Probably one reason flock size did not increase more rapidly was because the small flock already required more work than the average flockowner wanted to spend on it.

In October, 1948 the author was hired as Assistant Extension Economist in Marketing at South Dakota State College. Here was another chance to work with the producers to help them improve their poultry management practices on the farm. On July 1, 1949 the author was named Assistant Extension Poultry Specialist and from July 1, 1951 to this date he has been Extension Poultryman at South Dakota State College.

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PURPOSE OF THE SURVEY

The purpose of this survey was to attempt, in an organized way, to determine the opinion of a group of flock-owners who were using poultry house recommendations included in South Dakota State College Extension Circular 516, Modern Poultry Housing, March 1956.

Early in 1958 the circular was in short supply for the second time since the original printing. As a result, the Extension Poultry Office had been granted authority to have another supply printed.

At this time it seemed important to delay reprinting the circular until some of its contents could be evaluated. An attempt to determine how many of the recommendations some flockowners were using seemed necessary.

The Extension Poultrymen and Agricultural Engineers had many opportunities to work with the flockowners in the field and had made several recommendations for remodeling and building new structures for poultry houses. Some follow-up visits were made but none were conducted on an organized basis. These visits were few in relation to the number of flockowners originally assisted.

It was felt that an organized survey should be made to combine the general attitude of several different flock-owners toward the recommendations being used for poultry housing.

Extension Circular 516, Modern Poultry Housing, was revised and sent to the printers soon after the survey was made and summarized.

INTRODUCTION

Poultry has been an important source of food and cash income for the South Dakota farm family since the early settlers brought chickens with them into the state as part of their personal property. As of 1955, about 8 out of 10 South Dakota farmers still had a poultry flock.

Until about 1950 the poultry house recommended by the South Dakota Extension Service basically included a thin walled, cold room feeding area in the house and a double walled, low ceiling alcove above the dropping boards where the hens could huddle together and keep warm at night. Patty (1937) in "Poultry Houses for South Dakota", Extension Circular 362 quoted Dr. W. E. Poley, South Dakota State College Poultry Department Head, as saying:

> "Experiments on artificial heating of laying houses have been carried on in some other states and there is apparently some difference of opinion regarding the wisdom of this practice. It is believed that for the average winter in South Dakota, artificial heat may prove very practical, at least during December, January and February. This especially applies to laying houses which are ordinarily relatively cold. There is perhaps little necessity of having the temperature of the laying house much above 32 degrees F."

This circular described a 16' X 32' wood frame house and a 20' X 40' rammed earth house which were recommended for South Dakota. It was used by the County Extension Agents and the Poultry Specialists until about 1949 when there was indication that such housing was neither adequate nor up-to-date.

By 1949, some South Dakota flockowners were beginning to think seriously about insulating and ventilating their poultry houses and installing labor saving equipment. Little research information was available at that time for the Extension personnel to utilize in making recommendations to flockowners.

Carrick (1932) found no advantages for insulation of the poultry house. He compared an insulated room without heat that had restricted ventilation and a similar room heated to 40° F. or more, having an air change every 4 or 5 minutes, with a shed roof control room having a single wall and partially open front.

Production records were kept from December to July during 1930-1931 and 1931-1932. The average egg production per hen was as follows: in the insulated house without heat - 99 eggs, in the insulated house with heat - 102 eggs, and in the single wall house with no heat - 114 eggs.

Bruckner (1936) worked with 5 houses with and without insulation and with and without supplemented heat. The studies with heat covered a period of 3 years. The comparisons of insulated and uninsulated houses extend over a period of 8 years.

Some conclusions he reached included:

"1. Single Comb White Leghorn pullets can adjust themselves to different environments readily, providing the change is not too sudden. 2. The use of heat to maintain a mean temperature of 50° F. in

the laying pen had a stabilizing effect on winter egg production in that it prevented slumps in production following cold periods..... 5. If a poultry house is to be artificially heated, temperatures between 35° and 50° are preferred to those above 50°..... 8. Standard shed roof 20' X 20' poultry houses when insulated with 7/16 inch commercial insulation have mean temperatures only a few degrees higher than uninsulated houses during zero weather. It seems to be of no particular value unless heat is added. 9. An outlet flue opening near the floor tended to maintain a slightly higher temperature in an insulated building than did a rafter outlet in the same type of building..... 13. Laying hens in heated houses require less feed to produce a pound of eggs than those in unheated houses."

Ota (1956) reported on work conducted from 1951-1954 with Rhode Island Red hens under various environmental conditions in the U.S.A.R.S. laboratories at Beltsville, Md. The highest rate of production was obtained at 55° F. and the least amount of feed per dozen eggs was obtained at a room temperature of 65° F. as shown below:

Constant air temperature	Eggs per day per 100 hens	Feed consumed per day per 100 hens	Feed per dozen eggs
23	26	41	19.0
37	65	35	6.5
45	74	33	5.4
55	78	31	4.8
65	75	29	4.6
75	68	27	4.8
85	56	25	5.4

He concluded that laying houses should be designed to provide both winter and summer weather protection.

Hays (1958) studied the reaction of Rhode Island Red laying pullets to violent house temperature changes and cold temperatures in an uninsulated house. He found that in general, the egg production of all stocks declined in December, January and February. The data appeared to support the idea that house temperatures should be maintained above 40° in winter to make satisfactory egg production possible.

Rubida (1958) reported temperatures in an insulated and non-insulated house and outside temperatures during the winter months of 1956-1957 at the South Dakota State College Agricultural Experiment Station as shown below:

Month	Outdoor temperature	Temperature in insulated house	Temperature in non-insulated house
Jan. mean	7.9°F.	50.8°F.	34.9°F.
Jan. av. low	- 1.9°F.	46.6°F.	29.1°F.
Dec. av. low	14.8°F.	52.8°F.	39.4°F.

Studies by the United States Department of Agriculture (1950) as cited by Ota (1956) showed that the average time spent in caring for laying hens in flocks of more than 200 was 1.5 hours per hen per year. In flocks of less than 200, the average time spent was 2.5 hours per hen per year.

In 1949 the Extension Poultry Specialists and the Extension Agricultural Engineer at South Dakota State College started working on a 24' X 34' poultry house plan that would accommodate 300 birds. It was designed with insulation to conserve the body heat given off by the birds in order to warm the building. This would result in providing optimal conditions for bacterial action in a deep litter, thus adding more heat to the house. A ventilation system was designed to take the moisture out of the house along with excess warm air and ammonia fumes. Dropping pits were designed as a combined roosting and feeding area to lower the moisture load on the litter area.

A nesting room, an automatic water supply and feed bins within the house were included as additional labor savers.

The plan and housing recommendations were later published as South Dakota State College Extension Circular 481, June 1952. A model of the poultry house was built for use in exhibits and meetings.

After a few of the 24' X 34' houses were built it appeared that some of the flockowners wanted a larger house for a larger flock. In addition they were asking for some refinements in the plan such as trussed-roof construction and a larger door. With these changes a tractor and larger cleaning equipment could be used in the house.

During 1953 individual plans were prepared and several larger houses were built. By 1954 the demand for a larger plan was great enough to warrant printing Extension Circular 515, January 1955, "Modern Poultry House Plans for the South Dakota 500 Hen Laying House."

Since Extension Circular 481, June 1952, "Modern Poultry Housing", was out of date, Extension Circular 516, March 1956, "Modern Poultry Housing," was published to take its place. Ten thousand copies of Circular 516 were printed at this time and another 10,000 copies were printed in 1957.

THE SURVEY

The original questionnaire was designed to obtain the necessary information and then tested to see if that information was workable. It was sent to four flockowners along with a letter asking them to fill it out. The author worked with three other flockowners to help them fill out the questionnaire. All seven completed questionnaires were then studied to determine the importance of the questions, how well they were understood and the clarity of the answers. The next step was to rework the questionnaire into a final form to be mimeographed for distribution.

The names of the flockowners who had received help from the Extension Poultrymen and Extension Agricultural Engineers during the past 6 years were taken from the Annual Reports of the specialists. All of the flockowners names that were listed had been helped with poultry housing problems through a personal visit from one or more of the Extension specialists.

This list was then sent to each County Agent who had one or more of the flockowners listed in his county. The County Agents were asked to correct the list to insure accuracy of addresses. The County Agents were also asked to add any names of flockowners who had been helped by them and who had made some changes in their poultry housing. One hundred and four names were on the final list to receive the questionnaire.

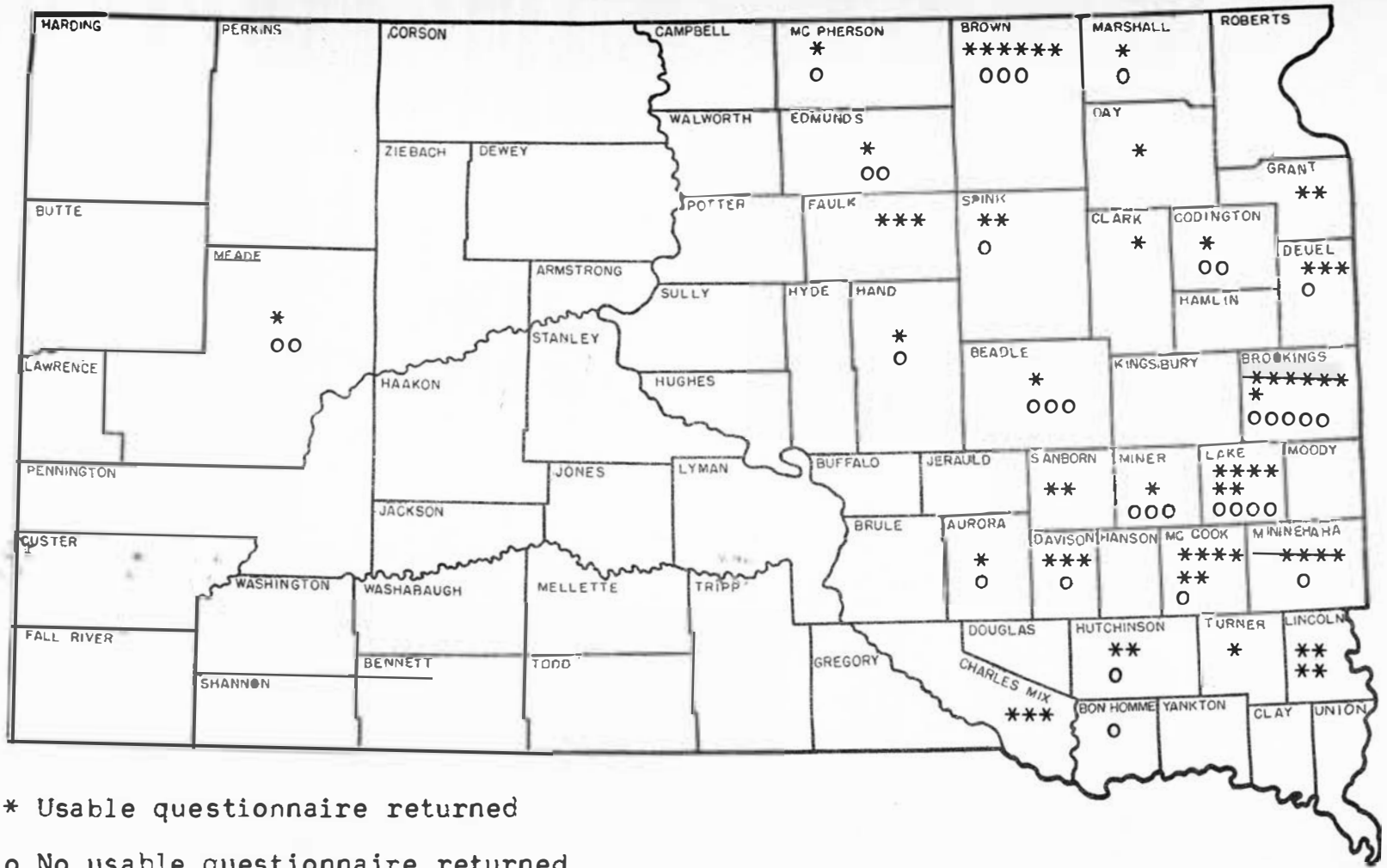
On March 12, 1958 the questionnaires were mailed. A short personal letter asked the flockowner to cooperate by filling out the questionnaire and returning it in the enclosed self addressed envelope. About 3 weeks later a follow-up letter went out to those on the list who had not made a return. A copy of the questionnaire and each of the two letters is included in the appendix of this report.

Of the 104 questionnaires that were sent out, 66 were completed and returned in a workable form (Figure 1). In addition, three replies were received stating that the flockowners were out of the poultry business. An additional two replies indicated that the flockowners had not made the suggested changes. In total there were 71 replies to the 104 questionnaires mailed. This was a return of 68%. Sixty-six of the questionnaires or 63.5% of the total number sent out were usable, as indicated above.

The group of flockowners who returned the questionnaires can not, necessarily, be considered typical South Dakota poultry flockowners because of their special interest in housing.

Some of the information summarized from the questionnaires such as breeds of chickens, ceiling height, type of floor, brand names of fans, cleanliness of eggs and egg marketing practices was not used in this report. This information was not felt to be complete enough or pertinent to the problem.

Figure 1. Location of Flockowners, by County, Who Were Sent Questionnaires



* Usable questionnaire returned

o No usable questionnaire returned

RESULTS

Rank of the Poultry Enterprise

It seemed logical to start with the importance of the poultry enterprise to the flockowners.

Sixty-one flockowners or 92.4% answered the question concerning rank of enterprise by gross income. Cattle and calves ranked first, hogs ranked second and the poultry project ranked third on the greatest number of farms (Table I).

TABLE I. NUMBER OF TIMES THE DIFFERENT FARM ENTERPRISES WERE LISTED IN VARIOUS POSITIONS ACCORDING TO GROSS INCOME

Enterprise	Rank					
	1st	2nd	3rd	4th	5th	Total
Cattle and calves	27	11	9	1	2	50
Hogs	9	20	7	7	0	43
Poultry	11	13	29	5	3	61
Dairy	2	3	5	8	5	23

The sequence of importance of the different livestock enterprises is similar to that shown by the State Crop and Livestock Reporting Service (1957). Thus, the flockowners surveyed were perhaps not too different from the average eastern South Dakota farmer.

When gross income was compared with farm size it was discovered that all the poultry flocks were not on small farms. Flocks on the larger acreages were also important sources of income for those flockowners (Table II).

TABLE II. NUMBER OF TIMES INCOME FROM POULTRY RANKED IN THE VARIOUS POSITIONS BY FARM SIZE

Acres in farm	Rank					
	1st	2nd	3rd	4th	5th	Total
0 - 320	4	8	11	1	0	24
321 - 800	4	4	10	3	2	23
801 - 1280	2	0	5	1	0	8
1281 and over	1	1	3	0	1	6
Total	11	13	29	5	3	61

Poultry was third in importance among all farm size groups. Seventy-seven percent of the flockowners reporting farmed 800 acres or less. Of the remaining 23% of the farms, 10% had 1280 acres or more.

Was the House a Good Investment?

There was a strong response when the flockowners were asked if they thought the poultry house was a good investment. Sixty-three answered the question (Table III).

TABLE III. WAS THE POULTRY HOUSE A GOOD INVESTMENT?

Answer	Number answering	Percent
Yes	62	98.4
No	1	1.6
Total	63	100.0

The flockowner answering "no" remarked that the returns on his investment and labor were not attractive. Forty-five flockowners gave reasons for their "yes" answers. Nine reasons were mentioned more than once. Some listed more than one reason which accounts for there being more reasons than persons reporting (Table IV).

TABLE IV. REASONS FLOCKOWNERS LISTED FOR THINKING THEIR POULTRY HOUSE WAS A GOOD INVESTMENT

Reasons mentioned	Number of times mentioned	Percent
Labor saver	31	42
Healthier birds	9	12
Better temperature control	8	11
Weekly income	6	8
Increased house capacity	5	7
Cleaner eggs	5	7
More income per bird	4	5
A good investment	4	5
Pleasant to handle	2	3
Total	74	100

The reason mentioned most often was that the house was a labor saver. This reason accounted for 42% of the answers. Those reasons next most frequently mentioned were that the house provided for "healthier chickens" and "better temperature control". These three reasons accounted for about two-thirds of all the reasons listed.

Cost of Construction

Construction cost is an important factor to a person planning either a new structure or the remodeling of an old structure. The flockowners were asked to list the cost of materials and the year the new construction or remodeling was completed. The year of completion was requested so that the cost figures could be grouped by year.

In many cases farm family labor made up all or part of the labor expended. It was felt that it would not be equitable or feasible to ask for labor costs.

Thirty-four new houses were reported on in the survey. The houses ranged in age from 1 year to more than 5 years old (Table V).

TABLE V. HOUSING COSTS PER SQUARE FOOT FOR NEW CONSTRUCTION

Year constructed	Before 1953	1953	1954	1955	1956	1957
Number of houses built	6	4	5	2	9	8
Highest cost per sq. ft., $	2.50	3.44	3.13	2.67	3.13	2.89
Sq. ft. of floor space in highest cost house	1200	960	1600	1500	800	1920
Lowest cost per sq. ft., $	1.84	1.87	1.67	2.20	1.12	1.25
Sq. ft. of floor space in lowest cost house	816	1500	1500	1500	1344	2400
Average no. of sq. ft. per house	1173	1230	1570	1500	1421	2125
Average cost per sq. ft. of house, $	2.15	2.38	2.34	2.44	1.84	1.86

The choice of materials and bargaining power are important factors that determine costs when a flockowner builds a new poultry house. During 1955 there were two houses in the survey group that had identically the same floor space but had a difference of 47 cents per square foot in cost. In the "Before 1953" group a smaller house cost less per square foot than a larger house while in the 1953 group the opposite was true.

A wide variation also existed when the costs of materials for remodeling the houses were summarized. Data from 35 remodeled houses were included in Table VI.

TABLE VI. COSTS PER SQUARE FOOT OF REMODELED HOUSES

Year constructed	Before 1953	1953	1954	1955	1956	1957	1958
Number of houses remodeled	4	3	3	0	9	14	2
Highest cost per sq. ft., $	1.23	1.59	.83	0	1.28	1.88	1.19
Sq. ft. of floor space in highest cost house	1632	1260	2400	0	1092	800	1260
Lowest cost per sq. ft., $	.52	.10	.36	0	.27	.43	1.02
Sq. ft. of floor space in lowest cost house	1344	520	1120	0	1656	576	1280
Average no. of sq. ft. per house	1104	993	1451	0	1403	1099	1270
Average cost per sq. ft. of house, $	.80	.98	.59	0	.60	.85	1.10

The largest number of houses were remodeled in 1957 and the greatest difference in materials costs existed in that group. The smallest number of houses were remodeled in 1958 and the least difference in materials costs existed in that group.

The average size of the 34 new houses was 1549 square feet of floor space with a materials cost of $3105.58. The

average size of the 35 houses that were remodeled was 1202 square feet of floor space with a materials cost of $997.00. These average figures may not necessarily be a good guide for someone planning to build or remodel a poultry house. The sample was small and there was a wide variation in costs between the different houses in any one year.

What Did the Changes Accomplish?

The changes resulted in improved efficiency of production. Three factors that increased efficiency were: a. an increase in flock size, b. an increase in production and c. a decrease in labor requirement for each unit.

Increase in Flock Size

In considering the increase in flock size the flock-owners were divided into two groups. One group consisted of 59 flockowners who had chickens before a change was made in the housing. There were seven flockowners in the other group that started a poultry flock when the changes were made. There was a large increase in flock size (Table VII).

TABLE VII. AVERAGE FLOCK SIZE BEFORE AND AFTER CHANGES IN POULTRY HOUSING

	No. of flocks	Before change: Total no. birds	Before change: Flock size	After change: Total no. birds	After change: Flock size	Percent increase
Had chickens before change	59	18,291	310	48,974	830	168
Had no chickens before change	7	------	---	3,258	465	---

Those who had a poultry flock before they made a change increased their flock size 168%. The other flockowners who started a poultry enterprise when housing changes were made averaged 465 birds which was a little over one-half the average flock size of the other group.

The average flock size of all 66 flocks added together was just under 800. A flock this size in South Dakota is big enough to demand attention in competition with other farm enterprises.

About 62% of the flocks were between 300 and 900 when the 66 flocks were listed by size groups (Table VIII).

TABLE VIII. LISTING OF FLOCKS BY SIZE GROUPS

Flock size	No. of flocks	Percent
0 - 300	7	10.7
301 - 600	22	33.3
601 - 900	19	28.8
901 - 1200	9	13.6
1201 - 2000	8	12.1
2000 - over	1	1.5
Total	66	100.0

The smallest flock listed was 175. In contrast to this, the largest flock listed was 3600. About two-thirds of the flocks reported were within a range of 300 to 900 hens. According to information from the State Crop and Livestock Reporting Service, the average South Dakota farm flock size was 150 birds in January, 1955.

Increase in Egg Production

The flockowners were asked to list the percent egg production they obtained in the old poultry house before the housing change was made. They were also asked to list the percent production they were getting after the change in housing. Production figures by percent were listed for each of the four seasons of the year.

Twenty-eight flockowners listed production for all four seasons both before and after housing changes were made (Table IX).

TABLE IX. AVERAGE DIFFERENCE IN PRODUCTION RATES AFTER MAKING CHANGES IN HOUSING

No. of flocks		Fall	Winter	Spring	Summer
28		+ 7.7%	+ 17.0%	+ 10.6%	+ 10.2%
	Range	0% to + 35%	0% to + 80%	- 10% to + 30%	- 2% to + 25%

The percent figure for each season was calculated by adding the positive differences and subtracting the negative differences for each of the seasons. Each of these figures was then divided by 28 to get the average production difference for the season. There were no minus figures listed for the fall and winter seasons. One flockowner who reported a plus 80% difference during the winter season had received no production during the winter under the old housing conditions. Two minuses were listed in the spring group and one in the summer group, in those cases greater production was reported for the winter season.

Protection from the extreme cold in the winter and the extreme heat in the summer probably was important in maintaining higher egg production during those two seasons. An apparent increase of about 11.4% in average production for

all flocks throughout the year with a 17% increase during the winter season is an important difference in favor of the remodeled or new poultry houses.

Labor Requirements

The flockowners were asked to report the hours of labor required for flock care and egg care for the two periods, i.e., before and after the change in housing took place. The labor was reported as estimated hours per week.

Thirty-six flockowners reported the hours of labor required for each job for both periods. It was surprising to note that the group of flockowners were caring for a larger number of birds after the change in housing with less labor than before. The flockowners were spending a total of about one-fifth less time in caring for the flock after the change in housing was made. Almost all of the time saved was from that required for caring for the birds. Egg care time stayed about the same. The efficiency of the units was increased in both flock and egg care because more volume was being handled (Table X).

TABLE X. TOTAL HOURS PER WEEK FOR FLOCK AND EGG CARE BEFORE AND AFTER CHANGES IN HOUSING, 36 FLOCKS

	Flock care	Egg care	Total
Before change	361	227 1/2	588 1/2
After change	280 1/4	226 3/4	507
Decrease	80 3/4	3/4	81 1/2
Percent decrease	22	.3	13.8

When the labor figures for the 36 flocks were based on a per flock per week basis it appeared that all the difference was in flock care time (Table XI).

TABLE XI. AVERAGE HOURS LABOR PER WEEK PER FLOCK FOR FLOCK CARE AND EGG CARE, 36 FLOCKS

	Hours for flock care	Hours for egg care	Total hours
Before change	10.0	6.3	16.3
After change	7.8	6.3	14.1
Decrease	2.2	0	2.2
Percent decrease	22.0	0	13.5

Even with the 2 1/2 times increase in flock size the flockowners were able to save about one-seventh of the total labor time required for the combined flock and egg care (Table XII).

TABLE XII. BIRD NUMBERS AND HOURS OF LABOR BEFORE AND AFTER HOUSING CHANGES, 36 FLOCKS

	Before changes	After changes	Bird number increase	Percent increase
Number of birds	11,790	28,583	16,793	142
			Decrease in hours of labor	Percent decrease
Hours of labor per week for flock care and egg care	588 1/2	507	81 1/2	13.8

The fact that the flockowners were able to increase the flock size and decrease the labor requirement at the same time must have had some influence on the response when flockowners were asked to answer the question about the poultry house being a good investment (Table III).

Most labor reports record poultry labor by hours per hen per year. The labor figures in this study were converted to a per hen per week and per hen per year basis (Table XIII).

TABLE XIII. HOURS PER WEEK AND PER YEAR PER BIRD BEFORE AND AFTER HOUSING CHANGES WERE MADE, 36 FLOCKS

	Hours per week per bird	Hours per year per bird
Before changes in housing	.050	2.60
After changes in housing	.018	.94

There were some dramatic differences in the efficiency of caring for the poultry flocks during the two periods, before and after the changes in housing were made. It is probably important to keep in mind the fact that the changes took place at this time but that all of the gain in efficiency may not be a result of the changes in housing alone. No doubt there are some other factors that were influential. Some of these factors might be better breeding in the pullets, more adequate feeding, more efficient disease control measures and, in general, a better management program because of an increased interest in the flock. In this survey there was no attempt to evaluate changes other than housing, consequently the other factors mentioned will have to be recognized only as existing.

How Were the Recommendations Accepted?

Finding out what a flockowner thought of a poultry house would mean very little unless the type of house he was using was also known. For this reason questions about seven recommended features of the South Dakota type poultry house were included in the survey. This was an attempt to get an indication of the use of the recommended practices and the flockowners attitude toward each practice. The seven features selected for the survey were: insulation, ventilation, dropping pits, deep litter, laying room, feed bins and work area.

Insulation

Separate questions were designed for wall and ceiling insulation because different thicknesses of insulation are recommended for the two areas.

Circular 516 recommends at least a two inch blanket of commercial insulation or a 3-5/8 inch fill of commercial or home processed insulation for the walls. Sixty-three flockowners answered the question regarding the type of insulation being used in the walls (Table XIV).

TABLE XIV. KIND OF INSULATION USED IN THE POULTRY HOUSE WALLS

	Number of houses with each thickness					
Kind	Less than one inch	1" to 1 1/2"	2"	2 1/2" to 3"	3 5/8"	Total
Blanket type	-	8	34	12	-	54
Fill type	-	-	--	--	7	7
Insulation board	2	-	--	--	-	2
					Total	63

Fifty-four houses or 86% of those reported in the survey had blanket insulation in the walls. A two inch blanket was the most frequent thickness used.

The recommendation for ceiling insulation has been 8 to 10 inches of home processed fill such as ground corn

cobs and lime or four inches of commercial fill. Fifty-eight flockowners listed four different types of ceiling insulation in the survey (Table XV).

TABLE XV. KINDS OF INSULATION USED IN THE CEILING

Kind	Number of houses with each thickness						
Inches	3 1/2	4 to 6	6 to 8	8 to 10	10 & over	Total	Percent
Home processed fill	1	15	8	6	3	33	56
Inches	3 1/2	4	4 1/2	5			
Commercial fill	3	6	2	1		12	21
Inches	2	3					
Blanket	9	3				12	21
Inches	1						
Fiber board	1					1	2
					Total	58	100

Over one-half of the flockowners used a home processed fill-type insulation in the ceiling. About one-fifth used a commercial fill-type material and another one-fifth used a blanket insulation.

Twenty-five houses in the group were reported to have a combination of blanket insulation in the walls and home